Today          **Ch 25** Geometric Optics: Reflection          **HW22**
Monday        **Ch 26** Geometric Optics: Rarefaction        **HW21Redo, HW23**
**Lab     # 7, Geometric Optics**

**This Time**
**Optics Introduction**
- **Light interacting with surfaces**
  - **Transmitted, Reflected**
  - **Optics**

**Chapter 25     The Reflection of Light:  Mirrors**
**25.1    Wave Fronts and Rays**
- **Seeing**

**25.2    The Reflection of Light**
- $\theta_r = -\theta_I$
- **Smooth vs. Bumpy Reflectors**

**Example 1.**  A laser mounted 3 cm above a horizontal mirror should be aimed at the mirror so that it bounces off and hits a target that is 9 cm over and 6 cm above the mirror.  How far over should the laser hit the mirror?

**25.3    The Formation of Images by a Plane Mirror**
- **Comparing Image and Object**
  - **Observations.**
    - **Explanations.**
  **Virtual Image**

**25.4    Spherical Mirrors**
  - **Focal Point, F**

**25.5    The Formation of Images by Spherical Mirrors**
- **Comparing Image and Object**
  - **Observations.**
- **Real Image**
- **Virtual Image**

**Example 2**  Say my tea pot is 4 inches tall, the spherical mirror has a radius of curvature of 2 feet.  If I hold the pot 1.5 feet from the mirror, A) where is the image, B) how tall is the image? Find these by drawing the picture to scale and tracing the rays.

**25.6    The Mirror Equation and the Magnification Equation**
- **Concave Mirror**
  - **Magnification**
  - **Mirror Equation**

**Example3:**  A concave mirror has a focal length of 42 cm.  The image formed by this mirror is 97 cm in front of the mirror.  What is the magnification?

  - **Convex Mirror**

3. A person stands 3.6 m in front of a wall that is covered floor-to-ceiling with a plane mirror. His eyes are 1.8 m above the floor. He holds a flashlight between his feet and manages to point it at the mirror. At what angle of incidence must the light strike the mirror so that the light will reach his eyes?

10. Concept Simulation 25.2 at www.wiley.com/college/cutnell (6th Edition) illustrates the concepts pertinent to this problem. A 2.0-cm high object is situated 15.0 cm in front of a concave mirror that has a radius of curvature of 10.0 cm. *Using a ray diagram drawn to scale, measure* (a) the location and (b) the height of the image. *The mirror must be drawn to scale.*

18. The focal length of a concave mirror is 17 cm. An object is located 38 cm in front of this mirror. (a) Where is the image located? (b) What is its magnification (don't forget the sign)?